

Life In The Stress Zone: The Role Of Fungal Symbiosis In The Distribution And Survival Of Plants In Puget Sound

Rusty Rodriguez, U.S. Geological Survey
Regina Redman, Montana State University
Marshal Hoy, University of Washington
Nancy Elder, U.S. Geological Survey*

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All plants in natural ecosystems are thought to be symbiotic with endophytic fungi that reside entirely within plant tissues. These fungi are known to be important to the structure, function, and health of plant communities. In fact, without fungal symbioses, plant communities would not survive many environmental stresses. Fungal symbionts express a variety of symbiotic lifestyles including mutualism, commensalism, and parasitism. Mutualistic fungi have been shown to increase plant growth and productivity, and confer stress tolerance against drought, salt, temperature, disease, herbivory. We propose that fungal endophytes provide a mechanism for the habitat expansion of native and invasive plants species including Dunegrass and *Spartina* spp. We assessed the endophytic fungi in several plant species and found that the host changes it's symbiotic partner in response to microhabitat stresses (a phenomenon we describe a Symbiotic Modulation). We are determining the biogeographic distribution of *Spartina* endophytes and thier significance in the invasiveness of this plant species. We have found that one fungal endophyte confers salt tolerance to plants and may be required for the inavasion of *Spartina* spp. The role of symbiosis in the invasion of invasive species and the evolution of plants in high stress habitats will be discussed.